



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: <b>INSULATING MATERIAL WITH WEB STRIPS BONDED BETWEEN LAYERS OF BATT MATERIAL AND METHOD FOR PRODUCING THE SAME</b>					
(57) Abstract					
<p>The insulating material (10) includes web strips (16) bonded between first and second batting material. First and second batting material each comprise layer of batting material (12, 14, 22 and 24). This creates macro air pockets which increase the insulating capability of the material without substantially increasing its weight. The process for manufacturing this insulating material (10) includes a series of carding steps to lay down the various materials and then transporting the materials to an oven for heating and bonding.</p>					

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INSULATING MATERIAL WITH WEB STRIPS  
BONDED BETWEEN LAYERS OF BATT MATERIAL AND  
METHOD FOR PRODUCING THE SAME

BACKGROUND OF THE INVENTION

Field of Invention

The present invention relates to insulating material for sleeping bags or similar applications wherein web strips are maintained between layers of batt material, and to the method for producing this material. This creates pockets of air within the insulating material resulting in increased insulation.

10 Description of the Prior Art

In the prior art, it is known to use multiple layers of batt material as thermal insulation. Examples of such material are disclosed in U.S. Patent No. 5,443,893 issued on August 22, 1995 and U.S. Patent No. 5,437,909 issued on August 1, 1995, both entitled "Multilayer Nonwoven Thermal Insulating Batts" with Herzberg as the inventor. However, this insulating and other similar insulating material may have an undesirably high weight.

20 It is also known to create insulating material by the process of first manufacturing a four-layer insulation by carding and sending the insulation through an oven; transporting the resulting roll to a small infrared oven, where strips of insulating material is applied by hand between batting layers using adhesive and slight heat from the oven; then the insulating material is rolled up and transported back to the original oven for final bonding of the strips of insulating material to the batting material. The strips between the layers of batting material create macro air spaces with insulating capability but with only a minimal increase in weight. This process is relatively slow and labor intensive and it is desirable to improve upon it.

OBJECTS AND SUMMARY OF THE INVENTION

It is therefore an object of this invention to increase the thermal insulating capability of insulating material made from batting fiber.

5 It is therefore a further object of this invention to increase the thermal insulating capability of insulating material without a substantial increase in weight of the insulating material.

10 It is therefore a still further object of this invention to provide an insulating material of increased durability.

15 It is therefore a still further object of this invention to provide a method for manufacturing such insulating material which has a reduced number of steps and is less labor intensive than methods used heretofore.

20 These and other objects are attained by a method in which first, by a two-card process, two layers of batting material are laid down. As the first two layers travel down to the next card, strips of pre-cut web are layered on the second layer. As the resulting material passes under the next card, two more layers of batting material are applied. The 25 resulting sandwiched product is inserted into a large oven for bonding of the entire product.

30 The resulting method and product is less costly, provides an improved product which is more durable and stable, avoids the need for adhesive to attach the strips and is less abrasive on the strips.

BRIEF DESCRIPTION OF THE DRAWINGS

35 Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawing, wherein:

Figure 1 is a front perspective view of the insulating material produced by the process of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing in detail, one sees a front perspective view of the insulating material 10 produced by the process of the present invention.

5 First and second layers of batting material 12, 14, respectively are carded and laid down at a first carding station.

10 First and second layers of batting material 12, 14 are then moved to a second carding station and strips of pre-cut web 16 are laid upon second layer of batting material 14. Web 16 can be a series of 15 substantially parallel strips running in a single direction as shown in Figure 1.

15 The resulting material is then passed to a third carding station where third and fourth layers of batting material 22, 24 are placed over web 16.

20 The resulting sandwiched product is then passed to an oven for heating and bonding of the entire product.

25 The web 16 causes macro air pockets to form in the insulating material, which increases the insulating capability without a significant increase in weight of the insulating material 10.

30 This process is a single-pass process which results in cost efficiency and further does not require the use of adhesive to attach the strips. Additionally, the sandwiching of the strips 16 between layers stabilizes the position of the strips so that the strips do not abrade against each other. 35 This produces an improved product of increased durability.

35 Thus the several aforementioned objects and advantages are most effectively attained. Although preferred embodiments of the invention have been disclosed and described in detail herein, it should be understood that this invention is in no sense limited thereby and its scope is to be determined by that of the appended claims.

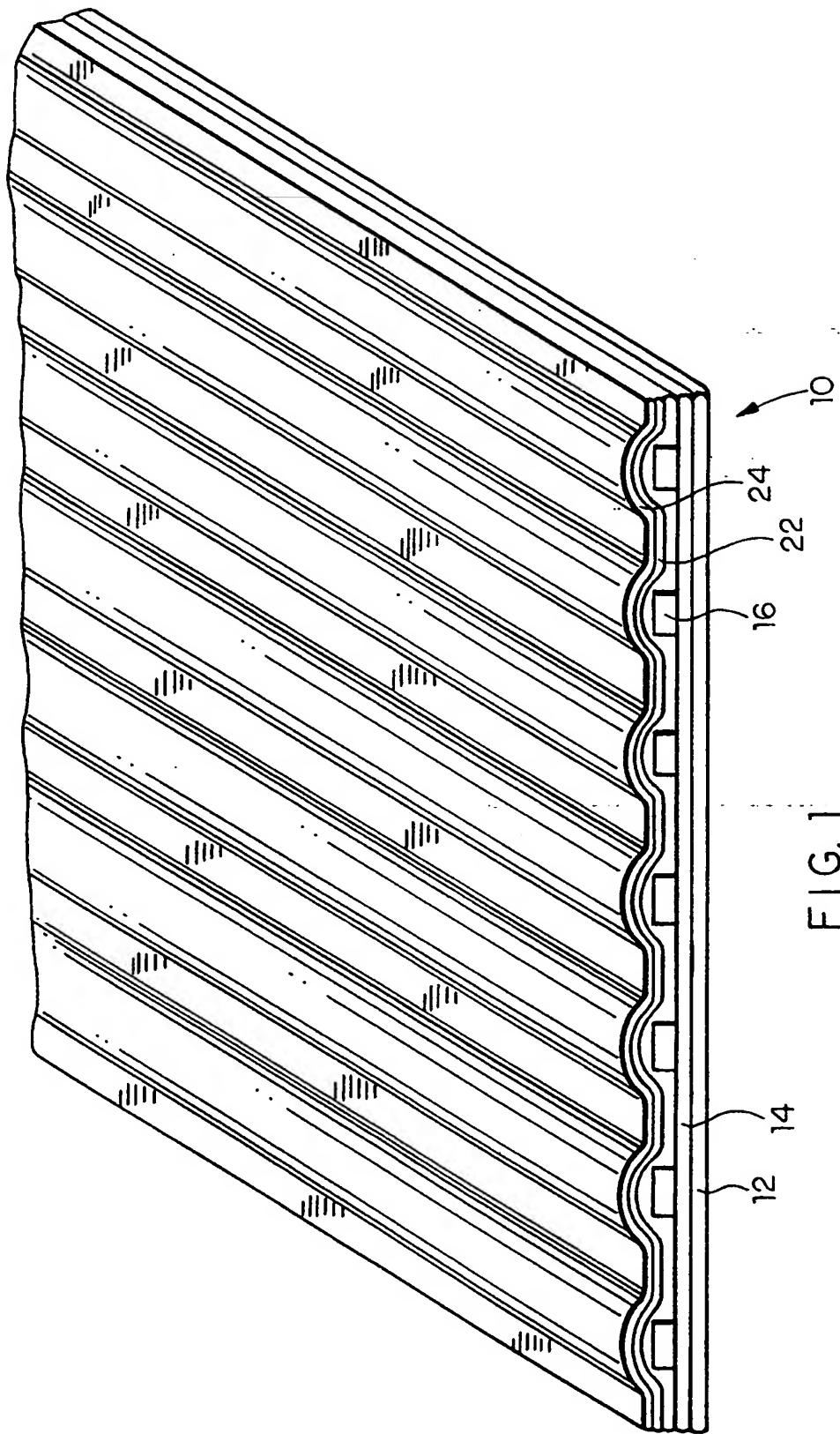
CLAIMSWhat is Claimed is:

1. A process for manufacturing insulating material, comprising the steps of:
  - laying down first batting material comprising at least one layer of batting material;
  - 5 laying down a plurality of strips of material on top of said first batting material;
  - laying down second batting material comprising at least one layer of batting material; and
  - 10 heating said first batting material, said plurality of strips, and said second batting material thereby bonding the same together.
2. The process of Claim 1 wherein said first batting material comprises at least two layers of batting material.
3. The process of Claim 2 wherein said second batting material comprises at least two layers of batting material.
4. The process of Claim 3 wherein said plurality of strips of material includes at least one series of substantially parallel strips.
5. An insulating material, comprising:
  - first batting material comprising at least one layer of batting material;
  - 5 a plurality of strips of material bonded on top of said first batting material; and
  - second batting material bonded on top of said plurality of strips.
6. The insulating material of Claim 5 wherein said first batting material comprises at least two layers of batting material.

7. The insulating material of Claim 6 wherein said second batting material comprises at least two layers of batting material.

8. The insulating material of Claim 7 wherein said plurality of strips of material includes at least one series of substantially parallel strips.

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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US99/16858

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :B32B 31/06, 31/26, 5/26; D04H 1/00  
US CL :442/366, 381; 156/324, 182

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 442/366, 381; 156/324, 182

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US 5,798,166 A (GROSS) 25 August 1998, col. 1, line 57-col. 2, line 16 and Figures 1 and 2.	5 and 8
Y	US 5,437,909 A (HERZBERG) 01 August 1995, col. 2, lines 58-63.	6 and 7
A	US 5,443,893 A (HERZBERG) 22 August 1995	1-8
A	US 5,670,238 A (EARL et al.) 23 September 1997	1-8
A	US 4,090,269 A (HUNT) 23 May 1978	1-8
A	US 4,910,055 A (WIGUTOW) 20 March 1990	1-8
A	US 5,033,135 A (CREEK) 23 July 1991	1-8

Further documents are listed in the continuation of Box C.  See patent family annex.

* Special categories of cited documents:	*T*	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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Date of the actual completion of the international search

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